2°)

* $U_{L_m} = 60V$

* $T_0 = 2ms$

* $T_0^2 = 4\pi^2 LC \Rightarrow L = \frac{T_0^2}{4\pi^2.C} = \frac{(2.10^{-3})^2}{4\pi^2.0,2.10^{-6}}$

$\Rightarrow L = 0,506H$

3°)

a- * $u_L(t) = u_{L_m} \sin(\omega_0 t + \varphi_{u_L})$

$\omega_0 = \frac{2\pi}{T_0} \Rightarrow \omega_0 = 1000\pi \text{ rad.s}^{-1}$

à $t = 0$: $u_L(0) = U_{L_m} \sin\varphi_{u_L} = -U_{L_m} \Rightarrow \sin\varphi_{u_L} = -1$

$\Rightarrow \varphi_{u_L} = -\frac{\pi}{2} \text{rad}$

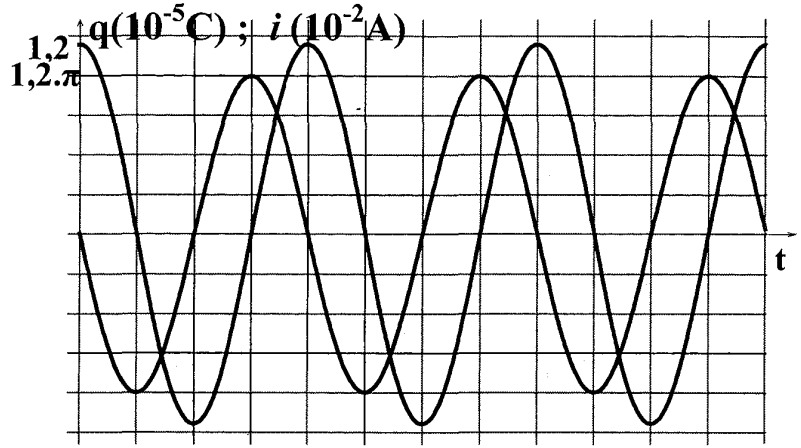
$\Rightarrow u_L(t) = 60\sin(10^3\pi.t - \frac{\pi}{2})$ (v)

* $q(t) = -Cu_L(t) \Rightarrow q(t) = -0,2.10^{-6} x 60\sin(10^3\pi.t - \frac{\pi}{2})$

$\Rightarrow q(t) = 1,2.10^{-5}\sin(10^3.\pi t + \frac{\pi}{2})$ (C)

* $i(t) = \frac{dq(t)}{dt} \Rightarrow i(t) = 1,2\pi 10^{-2}\sin(10^3\pi t + \pi)$ (A)

b- ***i*(t)** en quadrature avance de phase par rapport à q(t).



c- pour $t = \frac{T_0}{8} \Rightarrow q = 1,2.10^{-5}\sin(\frac{2\pi}{T_0}.\frac{T_0}{8} + \frac{\pi}{2})$

$\Rightarrow q = 0,6\sqrt{2}.10^{-5}C$

d- * $q = Q_m \sin(\omega_0 t + \varphi_q)$

$\frac{i}{\omega_0} = Q_m \cos(\omega_0 t + \varphi_q)$

$q^2 + \frac{i^2}{\omega_0^2} = Q_m^2 \Rightarrow i = \pm\omega_0\sqrt{Q_m^2 - q^2}$

*pour $q = \frac{Q_m}{2}$

$\Rightarrow i = \pm\omega_0\frac{\sqrt{3}}{2}Q_m = \pm 10^3\pi.\frac{\sqrt{3}}{2}.1,2.10^{-5}$

$\Rightarrow i = \pm 32,64mA.$